Resource Technologies, Inc.
1050 East Main Street Suite 4, Bozeman, Montana 59715
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July 28, 2017

Ms. Shannon Cala
MDEQ-PTS
P.O. Box 200901
Helena, MT 59620

Subject: Abbreviated Soil and Groundwater Sampling Workplan and Budget; Eddie's Corner; US Highway 87 and US Highway 191; Moore, Montana; Facility ID#14-02832; Release #1147; WP# 10642

Responsible Party:
Joe Bauman
Eddie's Corner
Route 1, Box 1
Moore, MT 59464
(406) 374-2471

Dear Ms. Cala:

On behalf of Mr. Joe Bauman, Resource Technologies, Inc. (RTI) is submitting the following workplan for installation of eight soil borings and collection of soil and groundwater samples at Eddie's Corner retail fuel dispensing facility located at the intersection of US Highway 87 (Montana Highway 200) and US Highway 191, west of Moore, Montana (Figure 1). Work tasks described in this workplan are being completed to provide data for designing and implementing an *in-situ* treatment of soil and groundwater impacts at the site. This workplan was prepared in accordance with the letter from the Montana Department of Environmental Quality-Petroleum Technical Section to Mr. Joe Bauman, dated June 19, 2017.

This workplan was prepared by:
Joe Laudon
Resource Technologies, Inc.
1050 East Main Street #4
Bozeman, MT 59715

DATA REVIEW

Soil and groundwater data collected at the site to date indicate that the vadose-zone hydrocarbon source was removed successfully when the old UST system was removed in the 1990s. Residual hydrocarbon impacts are composed primarily of diesel-range hydrocarbons that are distributed within the saturated zone between the site building and north site boundary generally to the west of the dispenser area (Figure 2).

Shallow site soils are composed of up to 6 feet of gravelly fill. Fill is underlain by gravelly glacial till to depths of 12 feet (south) to 20 feet (north). The till is underlain by a stiff, laminated clay.

Shallow groundwater appears to be perched and occurs within claybound gravel at the base of the till and above the laminated clay (the laminated clay appears to be unsaturated). Evidence of soil impacts were only encountered within the saturated interval at the base of the glacial till.

Existing site soil and groundwater data was reviewed by Mr. Paul Sturman, an Engineer with the Montana State University Center for Biofilm Engineering. Mr. Sturman recommended collection of soil samples from the impacted saturated zone to determine actual concentrations of sorbed hydrocarbons in the affected area and to determine composition of residual impacts. Mr. Sturman further recommended that soil samples be analyzed for total organic carbon. No other analyses were recommended by Mr. Sturman.

SCOPE OF WORK

Work tasks described in this workplan are intended to provide data for developing an *in-situ* corrective action plan to mitigate groundwater impacts and facilitate site closure. Work tasks are described below.

Soil Sampling

Eight soil borings will be installed at the locations shown on Figure 2 using direct push sampling methods. Soil samples will be collected continuously to the total borehole depths of 20 feet. During drilling, soil samples will be field screened for the presence of volatile organic compounds (VOCs) using a photoionization detector. Soil from the impacted interval in each borehole will be retained and submitted to Energy Laboratories of Billings for volatile petroleum hydrocarbons (VPH), extractable petroleum hydrocarbons (EPH), and total organic carbon (TOC) analyses.

Groundwater Sampling

Groundwater samples will be collected from monitoring wells MW-2, MW-5, MW-6, MW-7, MW-8, MW-9, and MW-10. Monitoring wells will be purged and sampled with a 2-inch variable-speed, stainless steel submersible sampling pump and clean vinyl tubing. The pump intake will be situated three to four feet below the measured water level within the screened interval. Prior to sampling, each well will be purged at the lowest sustainable pumping rate. Purge water will be discharged to a flow cell where water quality parameters including temperature, pH, conductivity, dissolved oxygen (DO), and oxidation/reduction potential (ORP) are continuously monitored. Water-quality-indicator parameters will be recorded every two to four minutes on a sampling log. An electronic water level sounder will be inserted in the well and suspended just above the static water level to facilitate water level monitoring throughout purging. Purge volume will be measured in a graduated cylinder from the flow cell. When water quality parameters stabilize for three successive readings of the water quality field parameters, the sample line will be severed at the flow cell inlet for sample collection into laboratory provided containers.

Groundwater samples will be submitted to Energy Laboratories for VPH, EPH Screen, and TOC analyses. Samples exhibiting a total extractable hydrocarbon (TEH) concentration greater than 1,000 micrograms per liter (µg/L) will be further analyzed for EPH aliphatic and aromatic fractions. In addition, samples collected from monitoring wells MW-6 and MW-7 will be analyzed for the lead scavengers 1,2 dichloroethane and ethylene dibromide.

Before purging, depth to water measurements will be collected from all site monitoring wells with an electronic water level sounder to facilitate determination of groundwater flow direction and gradient.

Investigation Derived Waste

Excess soil will be spread on the ground surface at an appropriate location on site. Impacted soil generated is expected to be minimal (less than one 5-gallon bucket) and will also be spread with clean soils. Purge water will be handled in accordance with the Options for Discharge of Hydrocarbon Contaminated Wastewater Technical Guidance Document. Disposable vinyl tubing and latex gloves will be disposed of in an on-site dumpster.

Reporting

Following receipt of soil and groundwater-sampling analytical results, RTI will submit an abbreviated report documenting all site activities and data generated. The report will be prepared in accordance with the MDEQ Standardized Abbreviated Soil Boring and Monitoring Well Installation Report format (AR-03). The report will include corrective action recommendations. Field notes, site sketches, photographs and other data will be available to MDEQ at any point during the investigation.

Schedule

Soil boring/sampling and groundwater sampling will be scheduled within 30 days of receiving MDEQ approval of this workplan contingent upon soil-boring rig availability.

BUDGET

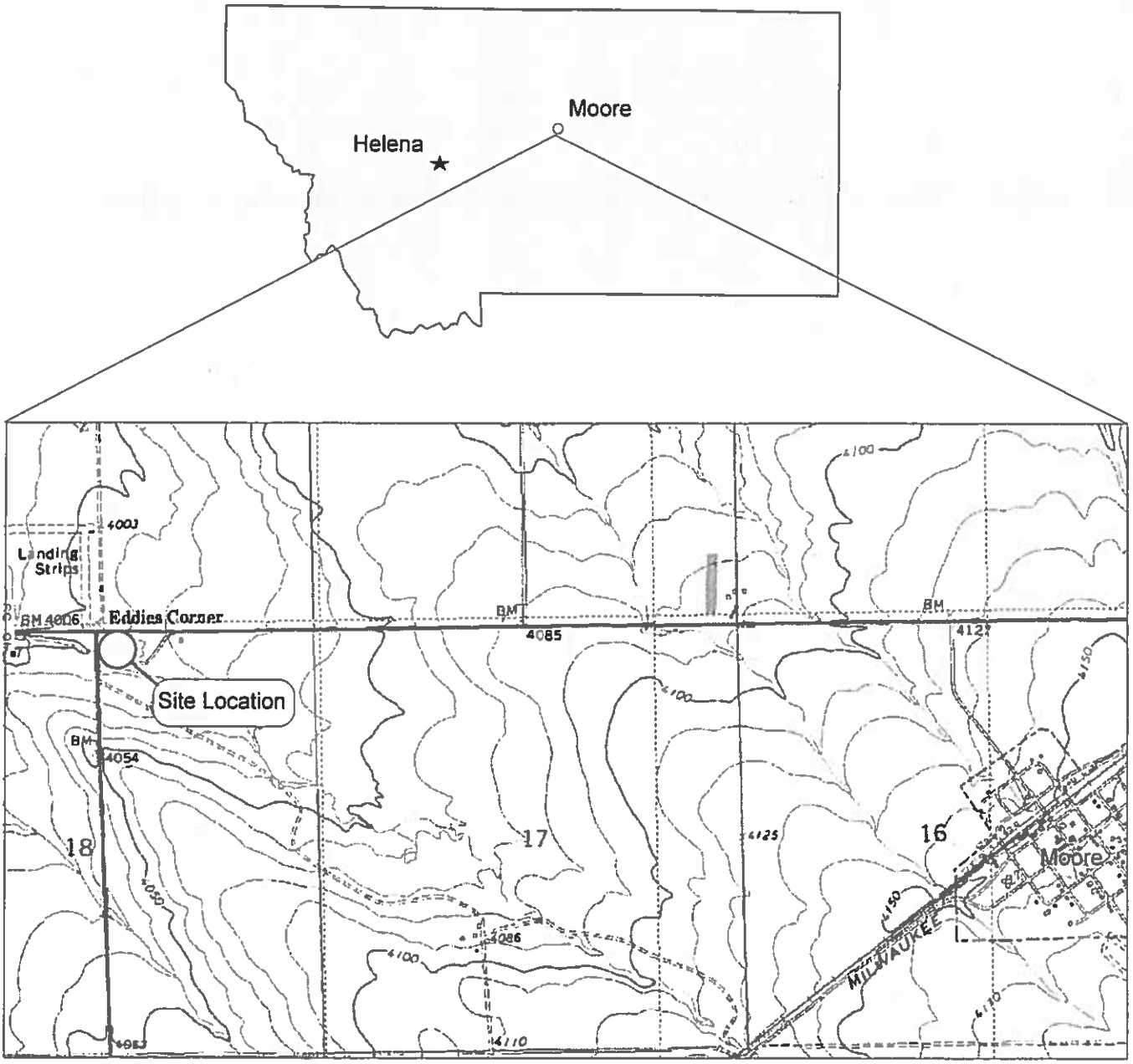
Costs associated with workplan preparation, soil boring, and reporting are shown in the attached cost estimate and groundwater sampling costs are included in the attached unit cost worksheet. Subcontractor bid for soil boring services was obtained from Olympus Technical Services. Olympus was chosen since the direct push rig they operate is capable of reaching the depths required to accomplish the goals of this workplan. The Subcontractor bid is attached. The total cost of the proposed work is $14,427.79. If you have any questions or comments regarding this workplan, please do not hesitate to call.

Respectfully Submitted,
Resource Technologies, Inc.

Joe Laudon
Hydrogeologist

attachments

cc: Mr. Joe Bauman, Eddie's Corner

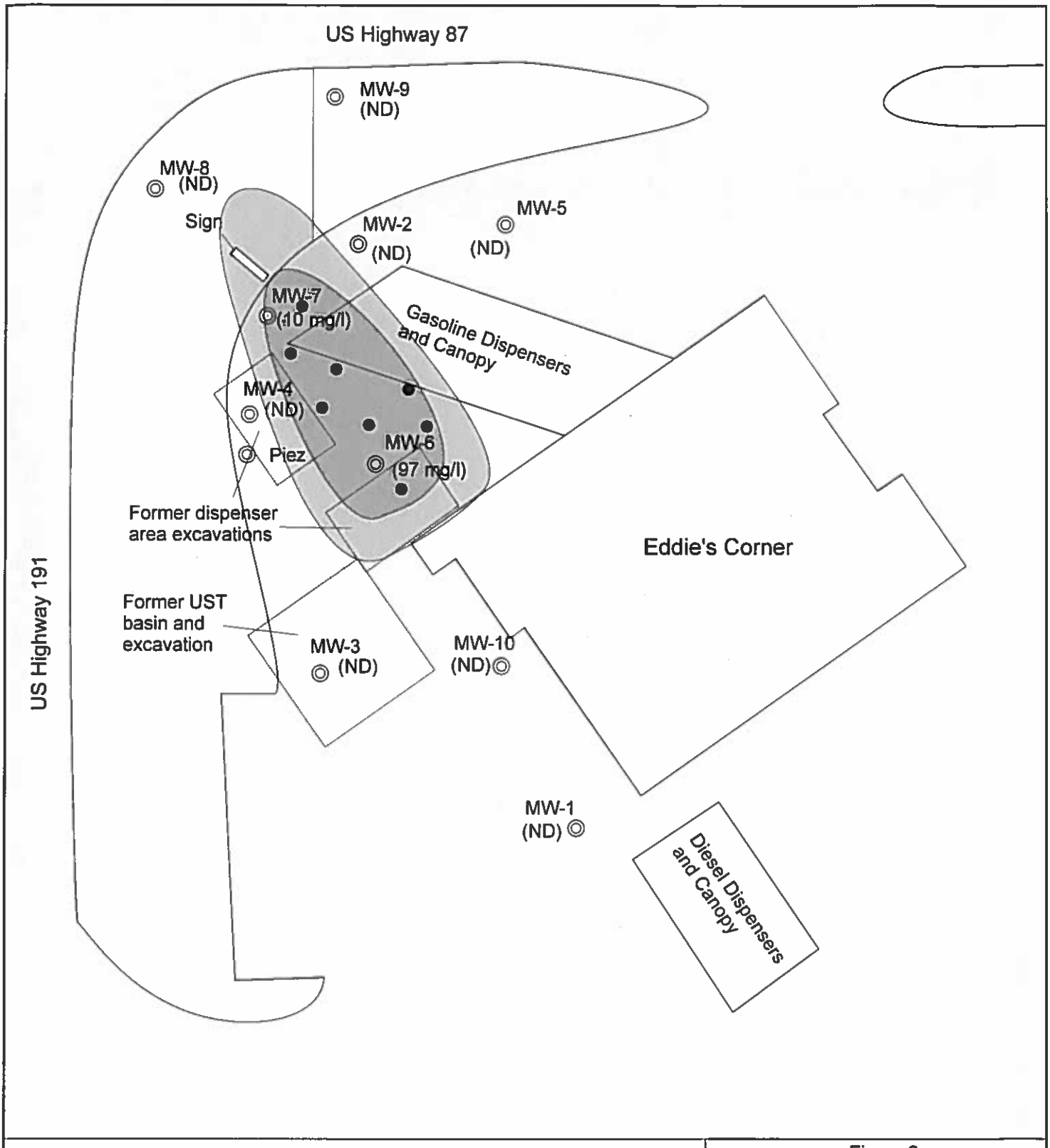


Base Map: U.S.G.S. Moore Quadrangle, 7.5 Minute Series - Scale: 1:24,000

Figure 1

Site Location Map
Eddie's Corner
Moore, Montana

Resource Technologies Inc.



Legend

MW-6 (97 mg/l) Monitoring well with TEH concentration, October 2014

Proposed Soil Borehole Location

TEH>100 mg/l

TEH>10 mg/l

TEH>1 mg/l

0 30 60 ft

Scale

Figure 2

Proposed Borehole Locations with TEH Concentration in Groundwater
Eddie's Corner
Moore, Montana

Resource Technologies Inc.

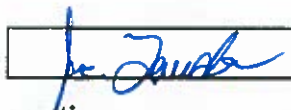
COST ESTIMATE -- **Workplan Preparation and Additional Remedial Investigation**
Eddie's Corner; Moore, Montana

TASK	ESTIMATED QUANTITY	UNIT	CATEGORY	UNIT COST	EXTENDED COST
Task 1: Workplan Preparation					
Data Review	4	hr	E-II	$126.75	$507.00
Obtain Bid	1	hr	G-II	$126.75	$126.75
Workplan Preparation	5	hr	G-II	$126.75	$633.75
Prepare Budget	3	hr	G-III	$142.25	$426.75
Drafting	1	hr	Drafter	$83.50	$83.50
Workplan Review	1	hr	E-III	$142.25	$142.25
Task 1 Subtotal					**$1,920.00**
Task 2: Soil Investigation					
Coordination/Utility Location	2	hr	G-II	$126.75	$253.50
Update Health and Safety Plan	1	hr	G-II	$126.75	$126.75
Soil Boring Installation					
Prep and Mobilization	6	hr	G-I	$106.75	$640.50
Soil Boring Oversight and Sampling	8	hr	G-I	$106.75	$854.00
Equipment and Expenses					
PID	1	day		$110.00	$110.00
Per Diem	1	day		$23.00	$23.00
Lodging	1	night		$96.00	$96.00
Misc Supplies (Gloves, etc)	1	lump		$10.00	$10.00
Mileage	300	mi		$0.53	$159.00
Subcontractor Costs:					
Geoprobe Services	1	lump			$4,472.00
7% Subcontractor Markup					$313.04
Analytical Services					
Soils Analysis	8	VPH		$120.00	$960.00
	8	EPH		$220.00	$1,760.00
	8	TOC		$15.00	$120.00
Sample Fees	8			$10.00	$80.00
Task 2 Subtotal					**$9,977.79**
Task 3: Groundwater Sampling					
See Attached Unit Cost Worksheet					**$5,246.50**
Task 4: Reporting					
Prepare AR-03 Standardized Report	1				$2,530.00
Task 7 Subtotal					**$2,530.00**
TOTAL					**$14,427.79**

Petroleum Tank Release Compensation Board
Groundwater Monitoring and Sampling Unit Cost Worksheet

Contractor Information

Company Name: Resource Technologies, Inc.
Address: 1050 East Main Street Suite 4
City, State, Zip: Bozeman, MT 59715
Cost Estimator: Joe Laudon
Phone: (406) 585-8005

Signature: 
Date: 7/28/17

Project Information

Site Name: Eddies Corner
Address: US Hwy 87 and US Hwy 191
City: Moore
Facility ID# 14-02832
Release # 1147
WP ID# 10642

Monitoring Well Details

Total Number of Wells at Site: 10
Number of Water Level Measurements Only [2]: 3
Number of Wells to be Monitored/Sampled [3]: 7
Well Casing Diameter (inches): 2
Average Depth to Groundwater (ft): 14
Average Depth of Wells (ft): 20

Well Purging Method

- ☐ Hand Bailing
- ☐ Peristaltic Pump
- ☐ Submersible Pump
- ☑ Micropurge
- ☐ No Purge
- ☐ Other (please specify)

Monitoring/Sampling Interval

Estimated Start Date: Fall 2017

- ☐ Quarterly # of events
- ☐ Semi-annual # of events
- ☑ Annual # of events: 1
- ☐ Other # of events (specify)

Other Services

- ☐ Free Product Recovery
- ☐ Groundwater Well survey
- ☐ Wellhead retrofit/reconstruction
- ☐ Other (please specify)

Cost Estimate Explanation:

[1] Mobilization/Demobilization: Includes all costs and mileage to transport equipment, materials, and personnel to and from the site location. More than one mobilization event will require justification and pre-approval by the DEQ-PTCS and Board staffs. This item should be on a per mile unit rate.

[2] Water Level Measurements: Includes all costs (labor, equipment, materials, and well consumables) to measure groundwater depth, collect other groundwater information from well, and decontaminate equipment. The well monitoring costs should be on a per well basis and does not include purging and sampling of the well.

[3] Well Monitoring/Purging/Sampling: Includes all costs (labor, equipment, materials, and well consumables) to monitor (see above), purge, sample groundwater, decontaminate equipment, take water level measurements and handle disposal of contaminated purge water. The cost should be on a per well basis.

[4] Laboratory Analysis: Includes all laboratory costs for all wells, for duration of project. It is realized that some laboratory analyses will not be conducted for every event and that the well sampling frequency may change.

[5] PTRCB Sampling Fee: Includes all costs related to management of the sample including: sample container, cooler, packing, shipping, handling, sample preservation, and office related handling charges.

[6] Report Preparation and Project Management: Includes all costs (labor and materials) project management, report preparation, and report submittal, including all office related costs, per groundwater sampling event.

Groundwater Monitoring and Sampling Unit Cost Worksheet

Task	Unit Cost	Number of Units	Total Cost
Project Management	$126.75 /hr	2	$253.50
Mobilization/Demobilization (1)	$2.80 /mile	300	$840.00
Field Work			
Water Level Measurements (2)	$40.00 /well	3	$120.00
Well Monitoring/Purging/Sampling (3)	$180.00 /well	7	$1,260.00
Other Service (please specify)			$0.00
Other Service (please specify)			$0.00
Lodging & Per Diem (Lodging – actual only)			
Lodging: # of people	/person per day	0	$0.00
Food: # of people 1 ($23.00 allowed)	$23.00 /person per day	1	$23.00
Laboratory Analysis (4)			
Volatile Petroleum Hydrocarbons (VPH)	$120.00 /sample	7	$840.00
Extractable Petroleum Hydrocarbons (EPH)			
EPH "screen"	$70.00 /sample	7	$490.00
EPH "fractions"	$150.00 /sample	7	$1,050.00
BTEX/MTBE/Naphthalene only-method:	/sample		$0.00
Polyaromatic Hydrocarbons (PAHs)	/sample		$0.00
PTRCB sampling fee ($10.00 allowed) (5)	$10.00 /sample	7	$70.00
Other (please specify) 1,2 DCA & EDB	$150.00 /sample	2	$300.00
Other (please specify)	/sample		$0.00
Report Preparation (6)			
Quarterly	/report		$0.00
Semi-annual	/report		$0.00
Annual	/report		$0.00
Other (Please specify)			$0.00
Monitoring & Sampling Total:			$5,246.50

Additional Conditions/Comments/Costs:

If you require assistance, call 406-841-5090
Submit completed form to:
Petroleum Tank Release Compensation Board
PO Box 200902, Helena MT 59620-0902

Olympus Technical Services, Inc.

July 26, 2017

Joe Laudon
Resource Technologies, Inc.
1050 East Main, Suite 4
Bozeman, MT 59715

Re: Proposal for Monitoring Well Installations
Eddie's Corner

Dear Mr. Laudon:

Olympus Technical Services, Inc. (Olympus) is pleased to present this proposal to complete soil borings and install monitoring wells for the above referenced project.

We understand that the scope of work will consist of the following tasks:

- Complete 8 soil borings to 20 feet below ground surface. Soil samples will be collected in 5-foot intervals on a continuous basis from ground surface to total depth.

- Abandon the borings with bentonite chips and seal the asphalt surface with cold-patch.

We propose to complete the borings with a track-mounted 7822DT Geoprobe™ and two-person crew mobilized from our Billings, MT office. We expect the work can be completed within two days, including mobilization. We propose to mobilize to the site the first day, complete as many borings as possible, overnight in Lewistown, return to complete the remaining borings on the second day, and demobilize to Billings.

Cost

Description	Units	Rate	Quantity	Total
Mobilization	lump sum	$1,440.00	1	$1,440.00
Well Installation	per boring	$340.00	8	$2,720.00
Per Diem	per person/day	$23.00	4	$92.00
Lodging	per person/day	$110.00	2	$220.00
Total				**$4,472.00**

The estimate is based on the following assumptions:

- Subsurface lithology is suitable for use of the direct push drill rig.
- Soil borings will be advanced to 20 feet below ground surface.
- Client is responsible for traffic control, encroachment permits, and access agreements.
- Client is responsible for clearing utilities.
- Client is responsible for containerizing and disposal of drill cuttings and decontamination liquids, if required.

We appreciate the opportunity to present this proposal. Please contact me if you have any questions.

Sincerely,
Olympus Technical Services, Inc.

Guy LaRango
Program Manager